

## A REVISION OF *TUMAMOCA* (CUCURBITACEAE)

DENIS M. KEARNS

Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166

### ABSTRACT

*Tumamoca* is a small genus of perennial North American cucurbits related to *Ibervillea*, *Ceratosanthes*, *Doyerea*, and *Halosicyos* (tribe Melothrieae, subtribe Dendrosicyinae). *Tumamoca*, previously considered monotypic, is now known to have two species, *T. macdougallii* of the Sonoran Desert and the here described *T. mucronata* from northern Mexico.

### RESUMEN

*Tumamoca*, un genero pequeño de Cucurbitáceas Norteamericanas, está mas cerca a *Ibervillea*, *Ceratosanthes*, *Doyerea*, y *Halosicyos* (tribu Melothrieae, subtribu Dendrosicyinae). Antes de esta revisión, *Tumamoca* estaba monotípica, ahora sabemos que hay dos especies, *T. macdougallii* del Desierto de Sonora y la especie, nueva, *T. mucronata* desde Mexico norteño.

Review of herbarium collections at TEX, in conjunction with the Flora of Mexico project, has uncovered a new species of *Tumamoca* Rose from the Chihuahuan Desert region of northern Mexico. Along with the description of the new species, a revision of the entire genus is presented.

*Tumamoca* is part of a closely related group of New World cucurbits (tribe Melothrieae, subtribe Dendrosicyinae), which includes *Ibervillea* Greene, *Ceratosanthes* Burm. ex Adans., *Doyerea* Gro-sourdy, and *Halosicyos* Mart. Crov. (Jeffrey 1990). Plants of these genera are perennials with tuberous rootstocks, tend to grow in xeric environments, and have fruits which turn orange or reddish at maturity. Their seeds are pyriform or spheroid, tumescent, and generally have prominent margins. A reddish aril-like flesh surrounds each seed. When the fruits are mature, birds peck holes in the brightly colored pericarp and remove the seeds, ostensibly effecting dispersal. Smaller fruits may be ingested whole. Flowers can be either nocturnal or diurnal, with species monoecious or dioecious. Generic boundaries are currently based on aspects of floral morphology (Kearns 1994).

The genus *Tumamoca* was established by Rose (1912) for a small perennial cucurbit that resembled a delicate *Ibervillea*. This "curious little cucurbit" grew over the low shrubs around the Desert Laboratory of the Carnegie Institution near Tucson. Rose chose the generic name to commemorate Tumamoc Hill, the Amerindian name

of the hill on which the Desert Laboratory was situated. *Tumamoca* was separated from *Ibervillea* by its monoecious vines, very slender "calyx tube" (hypanthium), roughened emarginate seeds, and clustered tuberous roots.

The characters used by Rose to separate *Tumamoca* from *Ibervillea* are still valid (with a couple of exceptions) and additional distinctions can be made between the two genera. The exceptions to Rose's criteria include the occurrence of clustered roots in some species of *Ibervillea* and the roughened seeds of *I. sonora* (S. Watson) Greene. In addition to the characters listed by Rose, *Tumamoca* is distinguished by having three staminodia, entire petals, glabrous interior corolla surfaces, and valvate buds. *Ibervillea* has five staminodia, petals with bifid apices and pubescent interior surfaces, and buds with infolded apices.

*Tumamoca* Rose, Contr. U.S. Natl. Herb. 16:21, pl. 17. 1912.—  
Type Species: *T. macdougallii* Rose.

Small delicate, perennial, monoecious vines, with branched, tuberous rootstocks. Tendrils simple. Leaves deeply 3-parted, with lobes once or twice parted, the segments narrow. Flowers salverform, pale yellowish, glabrous, opening at night, with elongate, narrow hypanthia and small sepals; petals narrowly triangular, entire, valvate in bud. Staminate flowers almost sessile, in racemes; stamens free, 3 (2 bithecal + 1 monothechal); anthers sessile, attached at top of hypanthium tube, with glabrous appendages at apex and base; thecae straight. Pistillate flowers solitary, from same leaf axils as staminate inflorescences; styles long, 3-fid, with long coiled stigmas; staminodia 3, small, level with branching of style. Fruits glabrous, fleshy berries, reddish or yellowish; seeds few, black, obovoid, with a rough testa and obscure margins.

Distributed from the southwest United States to northern Mexico in xeric environments.

#### KEY TO THE SPECIES OF *TUMAMOCA*

1. Leaf segments 2–10 mm wide; lower leaf surface with many very short hairs with well-developed multicellular bases (0.2–0.3 mm wide); hypanthia of staminate flowers 5–9 mm long; sepals triangular; pistillate flowers with peduncle 5–15 mm long ..... 1. *T. macdougallii*
- 1'. Leaf segments 0.5–2 mm wide; lower leaf surface sericeous, with hairs lacking multicellular bases; hypanthia of staminate male flowers ca. 14 mm long; sepals rounded, mucronate; pistillate flowers with peduncle 2–5 mm long ..... 2. *T. mucronata*

1. *Tumamoca macdougallii* Rose (Fig. 1), Contr. U.S. Natl. Herb. 16:21., pl. 17. 1912.—TYPE: UNITED STATES. Arizona: Tuc-

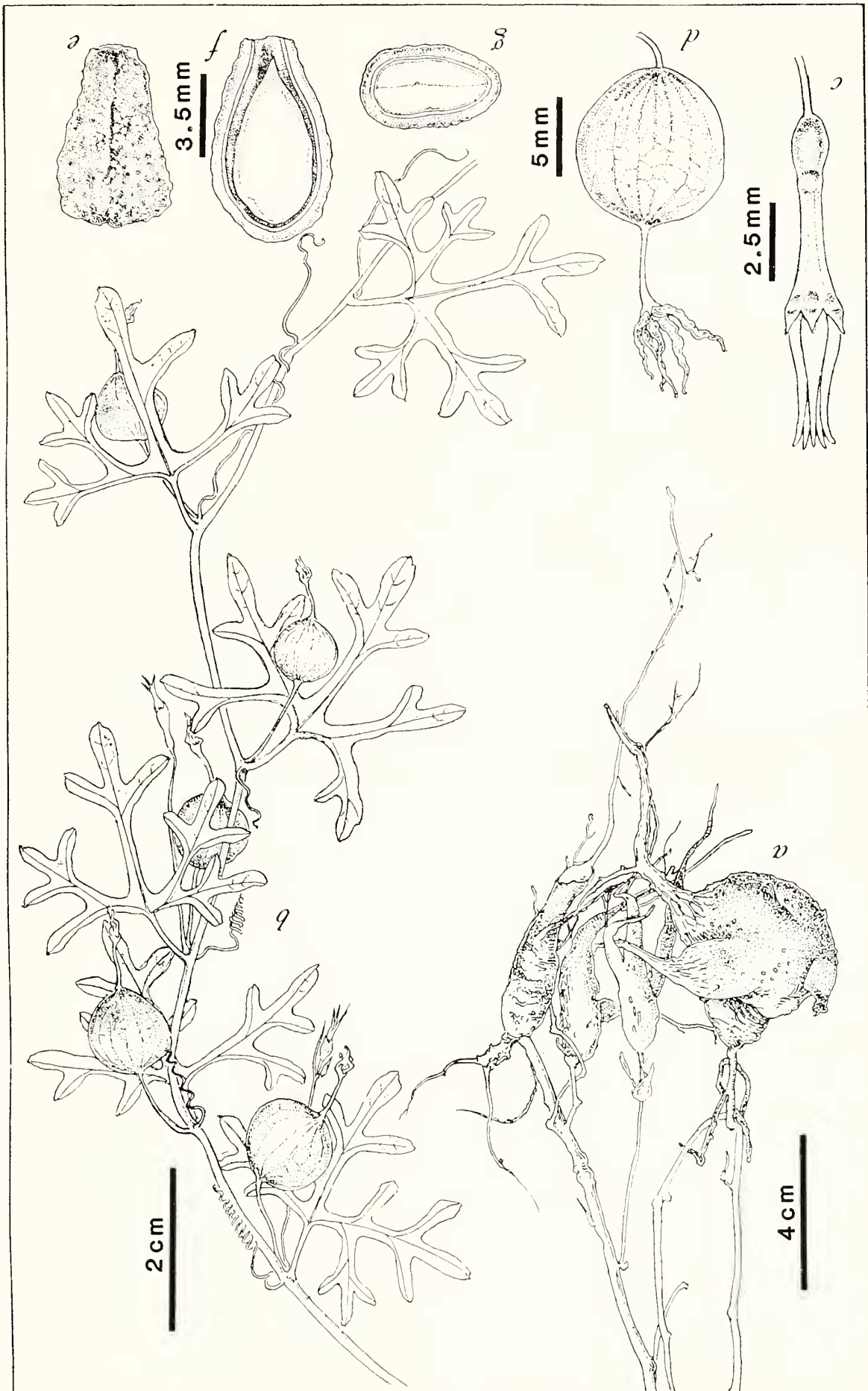


FIG. 1. *Tumamoca macdougallii* Rose. copied from Rose (1912). a. roots; b. fruiting branch; c. staminate flower; d. fruit; e. seed; f. seed, longitudinal section; g. seed, cross-section.

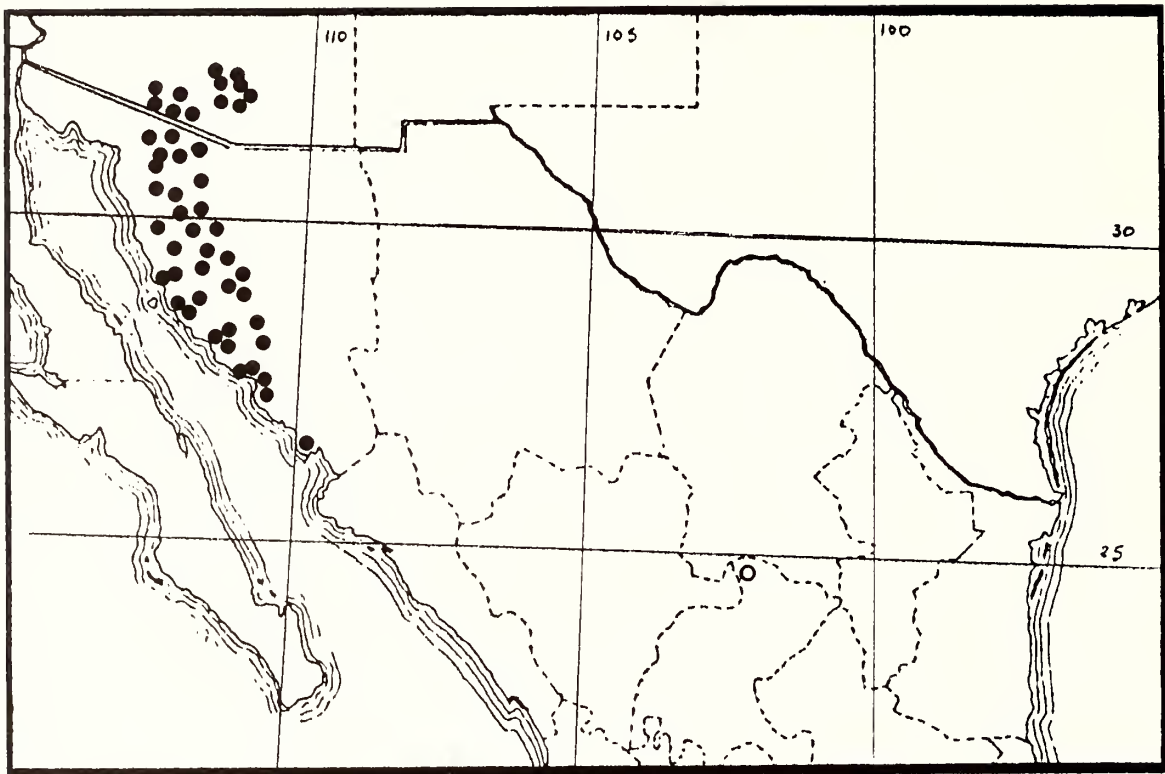


FIG. 2. Distribution of *Tumamoca*. ● = *T. macdougalii* in Arizona and Sonora, and ○ = *T. mucronata* in Zacatecas. Additional locations of *T. macdougalii* from Reichenbacher (1990).

son, collected near the Desert Laboratory, 31 Jul 1908, *MacDougal s.n.* (holotype: US accession # 591589!).

Stems glabrous, internodes 3–4 cm long. Leaves to 4.5 cm long, with segments 2–10 mm wide, upper surface glabrous, lower surface with very short hairs (<0.1 mm long) with well-developed multicellular bases (0.2–0.3 mm wide); petioles 1–2 cm long. Staminate flowers in racemes 3.5–10 cm long, with 2–19 flowers; peduncles 10–25 mm long (or longer); hypanthium 5–9 mm long and 1.3–1.7 mm wide at top; sepals triangular, 0.5–1 mm long, 0.3–0.7 mm wide; petals 4–4.5 mm long. Female flowers with peduncles 5–15 mm long; hypanthium 5.5–7.5 mm long, 1.5 mm wide at top; sepals 0.3–1 mm long, 0.7 mm wide; petals 5–6 mm long; ovary 4.5 mm long, 2 mm wide. Fruits red, rarely yellow at maturity, globose, 8–10 mm in diameter; seeds ca. 7 mm long, ca. 4.5 mm wide, ca. 3 mm thick.

Distributed from southern Arizona, United States, to Sonora, Mexico, at elevations below 1000 m, in Sonoran desert scrub, Sinaloan thornscrub, and Semidesert grassland (Fig. 2). The roots are said to smell like decaying cabbage when bruised. Javelina uproot and eat the succulent tuberous roots (Reichenbacher 1990).

The “Tumamoc globeberry” has been included on the Federal List of Endangered and Threatened Plants, but recent study has

shown that the species is more common and widespread than previously thought (Reichenbacher 1990). Given this clearer understanding of the distribution, a proposal is in process to remove *Tumamoca macdougalii* from the Federal list of protected species (Rutman 1992).

*Additional specimens examined.* MEXICO: Sonora: 10–15 m E of Empalme along rd to Cd. Obregon, 5 Sep 1974, *Gentry & McClure 23442* (US); S of Huatabampo on the road to Huatabampo, 0.25 mi NE of Maroncarit, 4 Sep 1989, *Sanders et al. 9246* (MO, TEX); Sierra de la Nariz & Sta. Magdalenas, 25 July 1855, *Schott sn.* (NY); 1.5 mi N of Kino Bay, 29 Aug 1941, *Wiggins & Rollins 163* (MICH, MO, NY); 5 mi N of Suboural, 3 Sep 1941, *Wiggins & Rollins 263* (MO); junction of road to Horcasitas with old hwy on rr 6 mi S of Carbo, 16 Sep 1934, *Wiggins 7273* (MICH, US).

UNITED STATES: Arizona: Pima Co., Quijotoa region, 24 Sep 1943, *Gooding & Reeder M22-43* (NY); 4 mi S of Mission San Xavier, 23 Aug 1941, *Wiggins & Rollins 46* (MO, UC, US); W of Mission road near the base of Black Mountain, San Xavier Indian Reservation, 2600 ft, 3 Sep 1984, *Lapre & Boyd s.n.* (UC); Sells-Ajo hwy N of Gunsight, 24 Sep 1943, *Gooding & Reeder s.n.* (MICH); near Desert Laboratory, Tucson, 4–23 Oct 1910, *MacDougal s.n.* (US); cultivated in Austin, Texas, from seed collected near Tucson, Ariz., *Kearns C-THS59* (living plants).

2. ***Tumamoca mucronata*** Kearns, sp. nov. (Fig. 3).—TYPE: MEXICO. Zacatecas: near and at Sierra del Yeso, almost due west of La Prensa de Los Angeles, 1400–1500 m, 30 Jun 1973, *Johnston, Wendt, & Chiang 11525A* (TEX!).

*T. macdougalii* Rose similis sed habitatione gypseo, foliis divisionibus angustatis, floribus majoribus, floribus feminenis in pedunculis brevioribus, et sepalis rotundatis mucronatisque.

Stems with scattered stiff uniseriate hairs, internodes 3–5 cm long. Leaves to 3.5 cm long, with very narrow segments (0.5–2 mm wide), upper surface with scattered uniseriate hairs, usually with small multicellular bases, lower surface sericeous, with hairs lacking multicellular bases; petioles ca. 1 cm long. Staminate flowers in inflorescences 4–5 cm long, with 7–10 (or more?) flowers; peduncles 25–30 mm long; hypanthium ca. 14 mm long and 1.5–2 mm wide at top; sepals rounded, mucronate, 0.8–0.9 long (including mucro), 0.6–0.8 mm wide; mucro 0.2–0.3 mm long; petals 5–6 mm long. Pistillate flowers with peduncles 2–5 mm long; hypanthium 9 mm long, 1 mm wide at top; sepals 0.7 mm long (including mucro), 0.5 mm wide; petals 4 mm long; ovary fusiform, glabrous, ca. 2.5 mm long (possibly longer at anthesis). Mature fruits unknown.

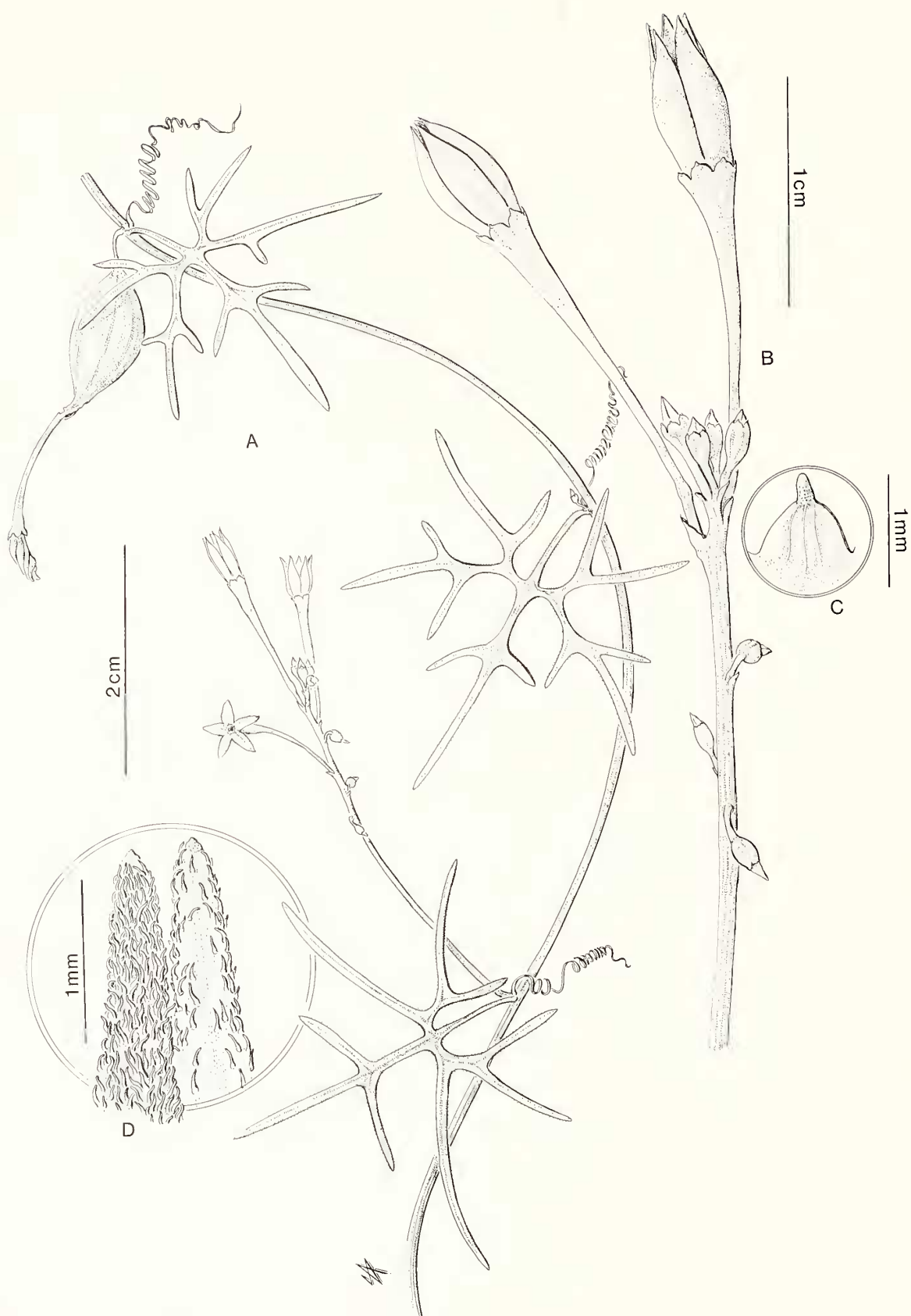


FIG. 3. *Tumamoca mucronata* Kearns. A. flowering and fruiting branch; B. staminate inflorescence; C. sepal showing mucronate apex; D. leaf segment apex showing lower and upper surface pubescence. Drawn from Johnston, Wendt, & Chiang 11525A (TEX).

*Tumamoca mucronata* is known only from the type location in the mountains near the border of Zacatecas and Coahuila in the southern Chihuahuan Desert (Fig. 2). This is an area of shaly-marly limestone and calcareous gravelly soils, interspersed with patches of almost pure gypsum. The species grows in desert scrub with *Larrea tridentata* (DC.) Cov., *Leucophyllum* H. & B., and *Acacia neovernicosa* Isley. The label on the type specimen indicates that the collection is a unicate, which means that there is no opportunity to designate or deposit a type in the Mexican national herbarium (MEXU). Unfortunately, the only specimen known to exist is the type at TEX. An attempt to revisit the type location in July 1991 was unsuccessful due to inclement weather and impassable dirt roads.

#### ACKNOWLEDGMENTS

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